

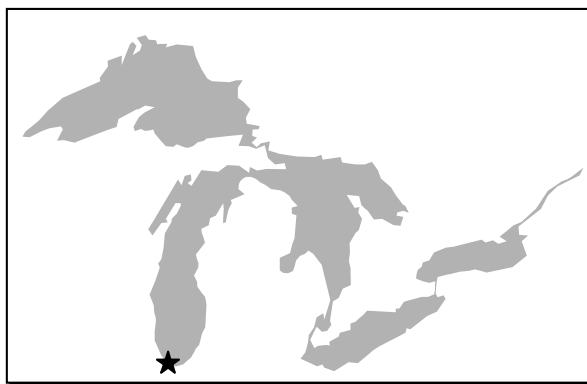
## **APPENDIX F**

### **LAKE MICHIGAN AREAS OF CONCERN**

## Grand Calumet River Area of Concern

### Background

The Grand Calumet River, originating in the east end of Gary, Indiana, flows 13 miles (21 kilometers [km]) through the heavily industrialized cities of Gary, East Chicago, and Hammond. The majority of the river's flow drains into Lake Michigan via the Indiana Harbor and Ship Canal, sending about one billion gallons of water into the lake each day. The Area of Concern (AOC) begins 15 miles (24 km) south of downtown Chicago and includes the east branch of the river, a small segment of the west branch, and the Indiana Harbor and Ship Canal. Today, 90 percent of the river's flow originates as municipal and industrial effluent, cooling and process water, and stormwater overflows. Although discharges have been reduced, a number of contaminants continue to impair the AOC.



### Beneficial Use Impairments

Problems in the AOC include contamination from polychlorinated biphenyls (PCB), polynuclear aromatic hydrocarbons (PAH) and heavy metals, such as mercury, cadmium, chromium, and lead. Additional problems include high levels of fecal coliform bacteria, biochemical oxygen demand (BOD), and suspended solids, oil, and grease. These contaminants originate from both point and nonpoint sources. Nonpoint sources include:

#### Beneficial Use Impairments

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.       | ✓ Eutrophication or undesirable algae.                           |
| ✓ Tainting of fish and wildlife flavor.                | ✓ Restrictions on drinking water consumption, or taste and odor. |
| ✓ Degradation of fish and wildlife populations.        | ✓ Beach closings.  |
| ✓ Fish tumors or other deformities.                    | ✓ Degradation of aesthetics.                                     |
| ✓ Bird or animal deformities or reproductive problems. | ✓ Degradation of phytoplankton and zooplankton populations.      |
| ✓ Degradation of benthos.                              | ✓ Added cost to agriculture and industry.                        |
| ✓ Restrictions on dredging activities.                 | ✓ Loss of fish and wildlife habitat.                             |

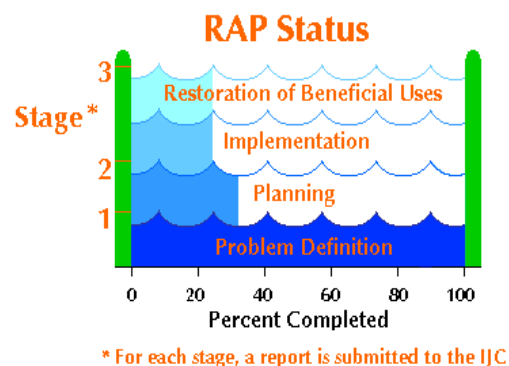
- ! **Contaminated Sediment.** The Grand Calumet River and Indiana Harbor and Canal contain 5 to 10 million cubic yards (3.9 to 7.7 million cubic meters) of contaminated sediment up to 20 feet (6 m) deep. Contaminants include toxic compounds (for example, PAHs, PCBs, and heavy metals) and conventional pollutants (for example, phosphorus, nitrogen, iron, magnesium, volatile solids, oil, and grease).
- ! **Industrial Waste Site Runoff.** Stormwater runoff and leachate from 11 of 38 waste disposal and storage sites in the AOC, located within .2 mi (.3 km) of the river, are degrading water quality on the AOC. Contaminants include oil, heavy metals, arsenic, PCBs, PAHs, and lead.
- ! **CERCLA Sites.** There are 52 sites in the AOC that are listed in the federal Comprehensive Environmental Response Compensation and Liability Act Information System (CERCLIS). Five of those sites are Superfund sites on the National Priorities List (NPL).
- ! **Hazardous Waste Sites under RCRA.** There are 423 hazardous waste sites in the AOC that are regulated under the Resource Conservation and Recovery Act (RCRA), such as landfills or surface impoundments where hazardous waste is disposed of. Of those sites, 22 are treatment, storage, and disposal facilities.

- ! **Underground Storage Tanks (UST).** There are more than 460 underground storage tanks in the AOC. More than 150 leaking tank reports have been filed for the Lake County section of the AOC since mid-1987.
- ! **Atmospheric Deposition.** Atmospheric deposition of toxic substances from fossil fuel burning, waste incineration, and evaporation enter the AOC through direct contact with water, surface water runoff, and leaching of accumulated materials deposited on land. Toxins from this source include dioxins, PCBs, insecticides, and heavy metals.
- ! **Urban Runoff.** Rain water passing over paved urban areas washes grease, oil, and such toxic organics as PCBs and PAHs into surface waters of the AOC.
- ! **Contaminated Groundwater.** Groundwater contaminated with organic compounds, heavy metals, and petroleum products contaminates AOC surface waters. The U.S. Environmental Protection Agency (EPA) estimates that at least 16.8 million gallons (63.6 million liters) of oil float on top of groundwater beneath the AOC.

Point sources of contaminants include

- ! **Industrial and Municipal Wastewater Discharges.** Three steel manufacturers contribute 90 percent of industrial point source discharges to the AOC. One chemical manufacturer discharges into the AOC. Permitted discharges include those of arsenic, cadmium, cyanide, copper, chromium, lead, and mercury. Three municipal treatment works (Gary, Hammond, and East Chicago sanitary districts) discharge treated domestic and industrial wastewater into the AOC.
- ! **Combined Sewer Overflows (CSO).** Fifteen CSOs contribute untreated municipal waste, including conventional and toxic pollutants, to the AOC. Annually, CSO outfalls discharge an estimated 11 billion gallons (41.6 billion liters) of raw wastewater into the harbor and river. Approximately 57 percent of the annual volume of CSO is discharged within eight miles (12.9 km) of Lake Michigan, resulting in near shore contamination with fecal coliform.

Historically, the Grand Calumet River supported highly diverse, globally unique fish and wildlife communities. Today, remnants of that diversity near the AOC are found in the Gibson Woods and Pine nature preserves. Those areas contain tracts of dune and swale topography and associated rare plant and animals species, such as Franklin's ground squirrel, Blanding's turtle, the glass lizard, and the black crowned night heron, among others. The problems described above, however, have impaired many desired uses of the AOC, including



### **RAP Status**

The Remedial Action Plan (RAP) process produced a Stage One document in January 1991. The state submitted a Stage 2 document to the International Joint Commission in December 1997. Stage 2 links physical, biological, and chemical stressors to each impairment of use. Stage 2.5 extends the Stage 2 ecosystem approach and reviews how each regulatory, voluntary, and enforcement activity in the AOC helps restore beneficial uses. The document begins to link those activities to environmental stressors. With the CARE committee's assistance, the state expects to finish the Stage 2.5 effort. By tracking the myriad activities that help restore beneficial uses, the CARE committee and state have begun to track Stage 3 progress, implementation.

## ***RAP Milestones***

The Stage 2.5 effort will be completed in Autumn 2000. The CARE committee will propose a suite of short-term and long-term environmental indicators and endpoints to delist each beneficial use. The CARE committee expects to have a list by the end of 2000.

## ***Priorities***

The Stage 2.5 will be complete by autumn 2000. The CARE committee will propose a suite of short-term and long-term environmental indicators and endpoints to delist each beneficial use. The CARE committee expects to have a list by the end of 2000.

### **☒ Remediation**

- Complete design of the proposed confined disposal facility that will hold dredged sediments from the Canal's Federal Navigation Channel
- Continue planning USX project to dredge five miles of Grand Calumet River

### **☒ Habitat/Resource Management**

- Continue the Natural Resources Damages Assessment

### **☒ P2/Nonpoint Source**

- Complete year 2 of the 3-year Total Maximum Daily Load for the River and Canal

### **☐ Human Health**

### **☐ Stewardship Sustainability**

### **☐ Education and Outreach**

### **☐ Research Projects/Data Gaps**

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## Muskegon Lake Area of Concern

### *Background*

Muskegon Lake is a 4,149-acre inland coastal lake located in Muskegon County, Michigan, along the east shore of Lake Michigan. The Area of Concern (AOC) includes the entire lake and the immediate drainage area, with the lake separated from Lake Michigan by sand dunes. The Muskegon River flows through the lake before emptying into Lake Michigan. Additional tributaries include Mosquito Creek, Ryerson Creek, Ruddiman Creek, Green Creek, and Four Mile Creek. The immediate inland area is primarily residential and industrial, with chemical and petrochemical companies, foundries, a pulp and paper mill, and other industries located on the lake or within its immediate watershed.



### *Beneficial Use Impairments*

Muskegon Lake was originally identified as an AOC because, before 1973, it received direct discharges of industrial wastewater, municipal wastewater treatment plant effluent, combined sewer overflows, and urban runoff. The discharges degraded water and habitat quality in Muskegon Lake and its tributaries. Through the Remedial Action Planning (RAP) process, the Muskegon Lake Public Advisory Council (PAC) and the Michigan Department of Environmental Quality (MDEQ) RAP Team have identified several beneficial uses as impaired.

#### ***Beneficial Use Impairments***

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.     | ✓ Eutrophication or undesirable algae.                           |
| Tainting of fish and wildlife flavor.                | ✓ Restrictions on drinking water consumption, or taste and odor. |
| ✓ Degradation of fish and wildlife populations.      | Beach closings.  |
| Fish tumors or other deformities.                    | ✓ Degradation of aesthetics.                                     |
| Bird or animal deformities or reproductive problems. | Degradation of phytoplankton and zooplankton populations.        |
| ✓ Degradation of benthos.                            | Added cost to agriculture and industry.                          |
| ✓ Restrictions on dredging activities.               | ✓ Loss of fish and wildlife habitat.                             |

### *AOC Status*

The initial Muskegon Lake RAP was completed in 1987 with limited public involvement. A Muskegon Lake PAC was officially established in October 1993 to obtain broad-based stakeholder input into the development and implementation of the RAP. The PAC includes representatives of various interests groups in the area. An update of the Muskegon Lake RAP was completed in October 1994. That document focused on five objectives: affording and insuring participation opportunities in the process by a PAC, as well as a team of specialists from various divisions of MDEQ (Surface Water Quality, Environmental Response, Waste Management, Fisheries, Air Quality, Land and Water Management, and Wildlife); documenting water quality data collected and analyzed since the 1987 RAP was published; analyzing the current status of use impairments; and making recommendations that, when carried out, will lay the foundation for the next phase of the RAP process (that is, implementing specific measures to remediate water quality problems and use impairments) and identification of data gaps. Studies addressing contaminated sediments, habitat, and water quality have been completed to fulfill recommendations of the 1994 RAP. A repository of that information is located at the offices of the Muskegon Conservation District.

***RAP Milestones***

- ✓ 1987: Muskegon Lake Remedial Action Plan completed
- ✓ 1993: Muskegon Lake PAC established
- ✓ 1994: Muskegon Lake Remedial Action Plan Update completed
- ✓ 1995: Muskegon & White Lake “Watershed” Study
- ✓ 1995: Wildlife Habitat Assessment
- ✓ 1995: Aquatic Plant Assessment
- ✓ 1997: Muskegon River Watershed Assessment
- ✓ 1998: Muskegon County - Land Use Trends Report
- ✓ 1998: Lower Muskegon River Streambanks Erosion Survey
- ✓ 1999: Ruddiman Creek Phase I Assessment
- ✓ 1999/2000: Sediment Toxicity Contamination Study
- ✓ 1999/2000: Muskegon River Mouth Wetland Buffer Zone Study
- ✓ 1999/2000: Lake Michigan Tributary Monitoring Project in Muskegon Lake AOC/Muskegon River Watershed

**Priorities**

The Muskegon Lake PAC is dedicated to actively participating in the continuing improvement of the quality of Muskegon Lake. RAP Team and PAC coordination is being pursued through scheduling regular monthly meetings, developing common objectives, and developing timetables and budgets for recommended actions.

**☑ Remediation**

- Contaminated sediment remediation on Muskegon Lake’s south side.
  - Division St. Stormwater Outfall in Muskegon Lake between Heritage Landing & the YFCA;
  - Former Grand Trunk Railroad/Sweetwater brownfield/State-City Public Launch Ramp site at Lakeshore Dr. and McCracken St.;
  - Ruddiman Creek and mouth at Muskegon Lake including the Amoco Tank Farm brownfield site;
  - Ryerson Creek and mouth at Muskegon Lake including the Teledyne brownfield site;
  - Westran Corporation Lake Fill and Harshorn Marina site on Muskegon Lake’s south side;
  - Muskegon River mouth wetland buffer zone including the Zephyr site and the Causeway/City Dump site;
  - Coal gasification “tar ball” site offshore from Morris St. on Muskegon Lake’s south side.
- Brownfield remediation on Muskegon Lake’s south shore.
 

Numerous brownfield sites are adjacent to the contaminated sediments sites listed above. Three priority sites for a coordinated soil and sediment cleanup approach are:

  - Amoco site at Ruddiman Creek mouth;
  - Teledyne site at Ryerson Creek mouth;
  - Former Grand Trunk Railroad/Sweetwater/Public Launch site.

## **☑ Habitat/Resource Management**

- Remove and prevent sediment load at mouth of river in Muskegon Lake's northeast end to restore critical fish and wildlife habitat
- Restoration of native habitat landscapes on brownfield/foundry fill areas along Muskegon Lake's south and east shoreline
- Permanent easement/conservancy of identified sensitive wildlife habitat and critical fish habitat areas (based on existing natural features inventory; pre-settlement vegetation maps; 1995 Muskegon Lake Habitat and Aquatic Plant Assessments; MDNR Fisheries Division information).

## **☑ P2/Nonpoint Source**

- Phase II Voluntary Stormwater ordinance and technical assistance program to incorporate Best Management Practices (BMP) into shoreline and watershed brownfield redevelopments.
- Implement BMPs on sites identified in the Muskegon River Streambank Erosion Inventory.

## **☑ Human Health**

- Identify and correct sanitary sewer integrity and cross connection problems to prevent direct sewage discharge and health advisories for Muskegon Lake and immediate tributaries.
- Determine impact of contaminated groundwater on the ecosystem in the Bear Creek, Bear Lake and Zephyr Oil sediment/wetland areas.
- Drinking water protection assessments (correlate Lake Michigan Mass Balance information with Lake Michigan and Muskegon Lake current and discharge information).

## **☑ Stewardship Sustainability**

- Develop a coordinated volunteer water quality monitoring program in Muskegon Lake, tributary creeks and Muskegon River watershed tributaries (based on results of the lake Michigan Tributary Monitoring project).
- Sustainability Training Program to institutionalize "Adopt-A-Watershed" activities throughout the Muskegon Lake AOC/River watershed (initiating sustainable volunteer and school programs to monitor ecosystems, restore habitat, clean up waterways, stencil storm drains, provide teacher training on ecosystems and watersheds).
- Single contact/gateway program established for public access to technical information, public involvement opportunities and long term training for public stakeholders capacity, leadership and empowerment for natural resources stewardship.

## **☑ Education and Outreach**

- Increase youth/adult public knowledge on ecosystem principles, remediation of contaminated sites, needs, management via programming in schools, conservation districts, university extensions and community colleges.

## **☑ Research Projects/Data Gaps**

- Identify health of benthic/ecosystem of nearshore sediments adjacent to brownfield (high potential redevelopment/dredge areas).
- Map/Identify groundwater quality from contaminated sites discharging/leaching into the lake and rivermouth area.
- Identify atrazine “tributary source” and Mass Balance pollutant “soil source” hot spot areas in the Muskegon River watershed for best management practice, education and remediation potential.
- Muskegon Lake nutrient budget (TMDLs, sediment loads, etc).
- Identify point source water quality discharged from regulated sources to lake/tributaries/storm drains.
- Sediment characterization in Bear Lake at Bear Creek mouth.

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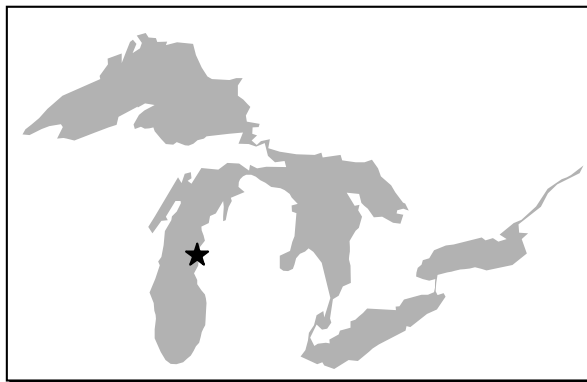
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## White Lake Area of Concern

### Background

White Lake is a 2,570-acre coastal, drowned river mouth lake located in Muskegon County, along the east shore of Lake Michigan in the vicinity of the communities of Montague and Whitehall. The Area of Concern (AOC) includes White Lake and a one-quarter-mile wide zone around the lake. Most of the land around the AOC is wooded or grassy, with some sand dunes located along Lake Michigan. Land use in the AOC is primarily recreational and agricultural, and to a lesser extent residential and industrial.



### Beneficial Use Impairments

The Remedial Action Plan (RAP) process identified eight of the Great Lakes Water Quality Agreement's 14 beneficial uses as impaired. Beneficial use impairments in the AOC include restrictions on fish and wildlife consumption, degradation of fish and wildlife populations, degradation of benthos, restrictions on dredging activities, restrictions on drinking water consumption, or taste and odor problems, and degradation of aesthetics.

White Lake was originally listed as an AOC primarily because contaminated groundwater was migrating to the lake from the Occidental Chemical Site (formerly Hooker Chemical Company). There are eight other contaminated sites that have the potential to affect the lake, some of them in various states of remediation.

### AOC Status

White Lake was originally listed as an AOC because of venting of a groundwater plume contaminated with an organic solvent from the Occidental Chemical Company site. Analysis of recent well monitoring data indicates that the plume of contaminated groundwater moving from the site is being intercepted by the lake-front purge well network and effectively treated before it is discharged to White Lake. Other potential sources of groundwater contamination to White Lake and its tributaries have been identified, and remediation efforts are under way.

There was substantial improvement in the water quality of White Lake before 1987, simply because of the diversion of industrial and municipal discharges away from the lake by the mid-1970s. Similarly, results of analysis of water samples collected in 1992 from the navigational channel between White Lake and Lake Michigan indicate that water quality has improved since the previous samples were taken in 1983. All parameters measured in 1992 met Michigan's water quality standards, established to protect

#### Beneficial Use Impairments

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.     | ✓ Eutrophication or undesirable algae.                           |
| Tainting of fish and wildlife flavor.                | ✓ Restrictions on drinking water consumption, or taste and odor. |
| ✓ Degradation of fish and wildlife populations.      | Beach closings.  |
| Fish tumors or other deformities.                    | ✓ Degradation of aesthetics.                                     |
| Bird or animal deformities or reproductive problems. | Degradation of phytoplankton and zooplankton populations.        |
| ✓ Degradation of benthos.                            | Added cost to agriculture and industry.                          |
| ✓ Restrictions on dredging activities.               | ✓ Loss of fish and wildlife habitat.                             |

human and aquatic life. Concentrations of heavy metals are lower than those observed in earlier sampling, chloride concentrations are the lowest recorded since testing of that parameter began in 1963, and phosphorous and nitrogen levels have remained relatively stable since the diversion of wastewater from White Lake in 1974. While a 28-day caged fish study conducted in the channel in 1992 showed that chlordane, DDE, and dieldrin are present, the levels accumulated in the fish do not suggest a substantial problem.

### ***RAP Milestones***

- ✓ 1987: MDNR completed a RAP and submitted it to the International Joint Commission for review.
- ✓ October 1993: The White Lake PAC was officially established.
- ✓ 1995: An update of the RAP was prepared by MDEQ and the White Lake PAC.
- ✓ 1995: Muskegon & White Lake “Watershed” Study
- ✓ 1995: Wildlife Habitat Assessment
- ✓ 1995: Aquatic Plant Assessment
- ✓ 1998: Sediment Toxicity Contamination Study
- ✓ 1998: White Lake County - Land Use Trends Report
- ✓ 1998: White Lake Boat Usage Study
- ✓ 1999/2000: Lake Michigan Tributary Monitoring Project in White Lake AOC/White Lake Watershed

### **Priorities**

The White Lake PAC is dedicated to actively participating in the continuing improvement of the quality RAP Team and PAC coordination is being pursued through regular meetings, development of common objectives, and developing timetables and budgets for recommended actions.

The Lake Michigan Federation and the White Lake PAC have completed a study of habitat and wetlands around White Lake. The study was undertaken in response to the 1995 White Lake RAP Update, which noted loss of fish and wildlife populations and recommended that a habitat assessment be conducted.

The study was designed to establish a baseline of information to assist in making future decisions regarding development around the lake. Conducted by a wildlife biologist, the study noted that sixty percent of the quarter-mile study area was already developed. It also found four high-quality marsh areas worth preserving and nearly continuous forest cover along most of the shoreline that provides valuable habitat for birds and other animal species.

Remediation of contaminated sediments in Tannery Bay is scheduled for as early as summer 1999.

### **Remediation**

- The Hooker Chemical/Occidental Chemical Company is currently sampling and evaluating sediment contamination. Remediation of specific lakebottom sites is likely and would benefit from a match of federal funds.
- Further study of the extent of contamination from the Whitehall Leather Company is needed, in addition to possible remediation funds.
- Assessment is needed of sediments at discharge points for other contaminated sites, including Muskegon Chemical/Koch Chemical, the White Lake landfill, an old Whitehall city wastewater treatment facility, and a former landfill on the marsh upstream of the lake.

☒ **Habitat/Resource Management**

- Acquisition of two large, undeveloped shoreline tracts owned by Dupont and Hooker Chemical/Occidental Chemical.
- Funds for outreach and implementation of habitat study recommendations.
- Native fish species (white bass, Great Lakes spotted muskellunge) restoration.

☒ **P2/Nonpoint Source**

- Assessment and remediation of shoreline sewage gaps.

☐ **Human Health**

☒ **Stewardship Sustainability**

- Public education programs on ecosystems for schools and adult populations.

☒ **Education and Outreach**

- School curriculums, tying environmental issues to state tests, such as the MEAP.
- Habitat education programs for shoreline property associations and schools, including fact sheets that can be tailored to specific ARCs.

☒ **Research Projects/Data Gaps**

- Quantitative information on the extent and impact to sediments of historical pollution from contaminated sites around the lake.
- Regular assessment of the health of benthic populations.
- Specific fish and wildlife contaminant monitoring data based upon knowledge of contaminated sites and sediments to direct sampling.

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## Menominee River Area of Concern

### Background

The Menominee River forms the boundary between the northeast corner of Wisconsin and the southern tip of the Upper Peninsula of Michigan. The river's headwaters are found in both states. The main stem of the river flows between the cities of Menominee, Michigan, and Marinette, Wisconsin before emptying into Green Bay.



The Menominee River Area of Concern (AOC) includes the lower 4.8 km of the river from the Upper Scott Paper Company (Wisconsin) Dam to the river's mouth, and approximately 5 km north and south of the mouth, along the adjacent shoreline of Green Bay. The AOC also includes the cities of Marinette and Menominee, as well as the adjacent near shore area of Green Bay, Wisconsin, extending three miles north and south of the river mouth. Land use in the AOC is primarily industrial and residential. A chemical company, two paper mills, two municipal wastewater treatment plants, a ship-building company, and a foundry are located along the river.

### Beneficial Use Impairments

✓ Restrictions on fish and wildlife consumption.	Eutrophication or undesirable algae.
Tainting of fish and wildlife flavor.	Restrictions on drinking water consumption, or taste and odor.
✓ Degradation of fish and wildlife populations.	✓ Beach closings.
Fish tumors or other deformities.	Degradation of aesthetics.
Bird or animal deformities or reproductive problems.	Degradation of phytoplankton and zooplankton populations.
✓ Degradation of benthos.	Added cost to agriculture and industry.
✓ Restrictions on dredging activities.	✓ Loss of fish and wildlife habitat.

### Beneficial Use Impairments

Of the 14 beneficial use impairments, 6 were identified through the Remedial Action Plan (RAP) process. A primary cause of the use impairments identified is arsenic contamination in the turning basin and in sediments along the right bank of the river, below the Ansul Fire Protection Company in Marinette, Wisconsin. This problem resulted from improper arsenic storage and disposal practices by Ansul. Other pollutants, such as mercury, polychlorinated biphenyls (PCBs), and oil and grease, have also contributed to use impairments.

### AOC Status

The Wisconsin Department of Natural Resources (WDNR) is working in cooperation with the Michigan Department of Environmental Quality (MDEQ) to develop and implement the RAP. The multi-stakeholder Citizens' Advisory Committee (CAC) and a Technical Advisory Committee (TAC) have been instrumental in the development of the RAP by mobilizing public support, increasing awareness, and conducting data and problem analysis. A vision statement for the desired future state of the Lower Menominee River was developed by the CAC and used as guidance in the preparation of RAP

goals and objectives that were developed jointly by the CAC and TAC. The Stage 1 Report for the Lower Menominee River RAP was completed and submitted to EPA and the International Joint Committee (IJC) in 1991. Annual progress reports have been prepared to track and celebrate achievements. The WDNR is working with Ansul Fire Protection Company under the RCRA Corrective Action Program to address arsenic contamination in the AOC.

## **RAP Milestones**

- ✓ 1996: RAP update published by the WDNR
- ✓ 1995: Paint sludge removal operations along Green Bay resulted in the excavation of more than 10 million pounds of hazardous waste from the bay. An additional 20 million pounds of contaminated sediments were removed during this effort, which was part of an enforcement order issued to the Lloyd Flanders furniture company in Menominee.
- ✓ 1991: The Stage 1 RAP Report was completed and submitted it to the IJC for review.
- ✓ ?: The Menominee River CAC was officially established.
- ✓ ?: The Menominee River TAC was officially established.

## **Priorities**

### **☒ Remediation**

- Local brownfields restoration projects.

### **☒ Habitat/Resource Management**

- Fish population and habitat restoration.
- Local waterfront redevelopment projects.

### **☒ P2/Nonpoint Source**

- Pollution prevention education and projects.

### **☐ Human Health**

### **☐ Stewardship Sustainability**

### **☒ Education and Outreach**

- Support for Citizens Advisory Committee.

### **☐ Research Projects/Data Gaps**

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## Lower Green Bay and Fox River Area of Concern

### Background

The Lower Green Bay and Fox River Area of Concern (AOC) consists of the lower 11.2 km of the Fox River below DePere Dam and a 55 km<sup>2</sup> area of southern Green Bay reaching to Point au Sable and Long Tail Point. The drainage area encompasses portions of 18 counties in Wisconsin and 40 watersheds of the Upper Fox River, Wolf River, and the Fox River basins, including the largest inland lake in Wisconsin, Lake Winnebago and its pool lakes. While water quality problems and restrictions on public use are most severe in the AOC, water resources of the entire basin are affected by runoff pollution from urban and rural areas, municipal and industrial wastewater discharges, and degraded habitats. Eleven use impairments have been documented, and two are suspected of being impaired (see impairment graphic).



### Beneficial Use Impairments

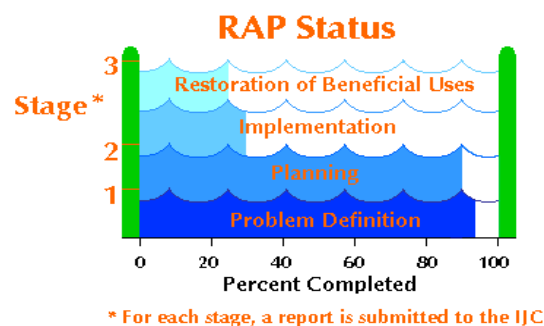
Of the 14 beneficial use impairments, 10 were identified for the Lower Green Bay and Fox River AOC, through the Remedial Action Plan (RAP) process. The two primary impaired desired uses of the AOC are shore and water use. Fishing, boating, swimming, hunting, and passive recreation have been restricted. Reproduction is impaired among both fish and fish-eating birds. Consumption advisories warn against eating mallard ducks and fish of 12 species. Shipping and navigation in the harbor and channel have been impaired because of the high cost of dredging and depositing of contaminated sediment. The harbor must be dredged to a depth of 24 feet to allow deep-draft navigation.

#### Beneficial Use Impairments

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.       | ✓ Eutrophication or undesirable algae.                           |
| Tainting of fish and wildlife flavor.                  | ✓ Restrictions on drinking water consumption, or taste and odor. |
| ✓ Degradation of fish and wildlife populations.        | ✓ Beach closings.  |
| Fish tumors or other deformities.                      | ✓ Degradation of aesthetics.                                     |
| ✓ Bird or animal deformities or reproductive problems. | ✓ Degradation of phytoplankton and zooplankton populations.      |
| ✓ Degradation of benthos.                              | Added cost to agriculture and industry.                          |
| ✓ Restrictions on dredging activities.                 | Loss of fish and wildlife habitat.                               |

### RAP Status

The Lower Green Bay RAP was developed by the Wisconsin Department of Natural Resources (WDNR) under a multi-stakeholder partnership with other agencies, local governments, scientists, citizens, industries, and environmental groups. More than 75 people participated for two years on four technical advisory committees (TAC) and a citizen's advisory committee (CAC) for development of the community-based plan. The TAC developed reports identifying the problems and goals, and objectives for management and technical solutions designed to restore the bay and river. The CAC identified the 10 most pressing problems that should be addressed in the RAP, defined a "desired future state" for lower Green Bay and the Fox River, and advised on recommended remedial actions. The RAP was completed



in 1987 and adopted as part of Wisconsin's Water Quality Management Plan in 1988. Almost two-thirds of the RAP's 120 recommended actions have been initiated. The RAP is viewed as a "living" document and will be updated regularly. Implementation and updating of the RAP is facilitated by WDNR through a Green Bay RAP Public Advisory Committee, a Science and Technical Advisory Committee and a Public Education and Participation Advisory Committee. In addition, two nonprofit organizations have been established by community leaders to promote implementation of nonpoint source pollution controls (Great Lakes Nonpoint Abatement Coalition) and to determine the most cost-effective actions to meet the goals of the RAP (Northeast Wisconsin Waters for Tomorrow, Inc.)

### ***RAP Milestones***

- ✓ The RAP was completed in 1987 and adopted as part of Wisconsin's Water Quality Management Plan in 1988.
- ✓ Since 1988, 38 of the 120 recommended remedial actions have been implemented.

### **Priorities**

Substantial progress has been made in developing the RAP and implementing recommended actions. However, despite incremental improvements implemented to prevent water pollution, restore habitats, improve public access, and further define the causes of impaired uses, none of the problems in the AOC has been completely solved. Recommendations are being implemented sequentially—the easiest have been started, the more difficult have yet to be implemented. Full RAP implementation will be well beyond the year 2000.

#### **☒ Remediation**

- Contaminated (PCB) sediment remediation in 39 miles of the Lower Fox River

#### **☒ Habitat/Resource Management**

- Restore an eroded chain of barrier islands and associated aquatic habitats (Cat Island archipelago)
- Restore littoral habitats
- Protect remaining wetlands
- Exotic Species Prevention

#### **☒ P2/Nonpoint Source**

- Comprehensive watershed projects to abate runoff pollution
- TMDL for phosphorus and suspended solids in the Fox-Wolf Basin
- Riparian buffers throughout the Fox-Wolf Basin

#### **☐ Human Health**

#### **☒ Stewardship Sustainability**

- Sustainable Green Bay Initiative
- Enhance public access

#### **☐ Education and Outreach**

## **☑ Research Projects/Data Gaps**

- State of the Bay Report

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## Milwaukee Estuary Area of Concern

### Background

The Milwaukee Estuary Area of Concern (AOC) includes: the lower 5 km of the Milwaukee River downstream of North Avenue Dam; the lower 4.8 km of the Menominee River downstream of 35th Street; the lower 4 km of the Kinnickinnic River downstream of Chase Avenue; the inner and outer harbors and the near shore waters of Lake Michigan, bounded by a line extending north from Sheridan Park to the city of Milwaukee's Linnwood water intake. The immediate area draining to the AOC encompasses 57.5 km<sup>2</sup> or 2.6 percent of the entire basin, including lands that drain directly to the AOC via storm sewers and combined sewer systems. This relatively small drainage area contributes disproportionately large amounts of pollutants associated with urban runoff. The AOC acts as both a source of pollution to Lake Michigan and a sink for pollutants generated throughout the watershed. Consequently, water quality is affected by pollution sources associated with land use from the entire Milwaukee River drainage basin. Current use impairments are identified in the impairment graphic.



### Beneficial Use Impairments

Of the 14 use impairments, 11 were identified for the Milwaukee AOC through the RAP process. Problems in the AOC have impaired many uses, including: fish and wildlife consumption, recreational boating, swimming, degraded fish, navigation, and aesthetics.

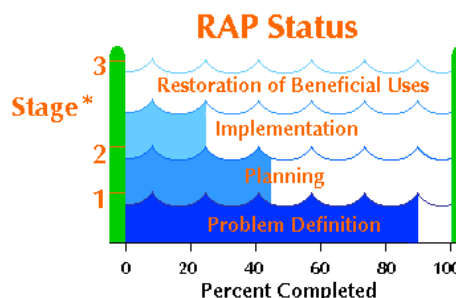
### RAP Status

Stage One of the Milwaukee Estuary Remedial Action Plan (RAP) was initiated in 1988. The Wisconsin Department of Natural Resources (WDNR) has primary responsibility for development of the RAP. A Technical Advisory Committee, a Citizen's Advisory Committee (CAC) and a Citizen's Education and Participation Subcommittee have advised WDNR during development of the RAP. The CAC has been instrumental in building consensus from divergent views, striving for community wide unity and enthusiasm for the RAP. Much public awareness has been generated.

The development of a Stage Two RAP began in 1991, with technical work groups developing recommendations. The RAP fosters the philosophy of continuous improvement. The 1993 Milwaukee Estuary RAP documents progress made on work under the RAP and

#### Beneficial Use Impairments

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.       | ✓ Eutrophication or undesirable algae.                         |
| Tainting of fish and wildlife flavor.                  | Restrictions on drinking water consumption, or taste and odor. |
| ✓ Degradation of fish and wildlife populations.        | ✓ Beach closings.  |
| ✓ Fish tumors or other deformities.                    | ✓ Degradation of aesthetics.                                   |
| ✓ Bird or animal deformities or reproductive problems. | ✓ Degradation of phytoplankton and zooplankton populations.    |
| ✓ Degradation of benthos.                              | Added cost to agriculture and industry.                        |
| ✓ Restrictions on dredging activities.                 | ✓ Loss of fish and wildlife habitat.                           |



\* For each stage, a report is submitted to the IJC

outlines a five-year work plan for implementation of the RAP. The Stage Two RAP is at least 80 percent complete.

### ***RAP Milestones***

- ✓ July 1994: Thus far, RAP progress report completed, including 32 Stage Two recommendations
- ✓ March 1991: Stage One RAP document completed

### ***Priorities***

The restoration of the Milwaukee Estuary AOC will require a long-term commitment, spanning 25 or more years. Thus far, approximately 70 recommendations have been developed by the RAP workgroups. Of those recommendations, 31 are targeted for implementation during the next few years (that is, 12 recommendations that pertain to assessment and monitoring to support informed, cost- and resource-effective decisions; 6 recommendations that pertain to demonstration projects, such as controlling runoff from storage piles, creating buffer strips, restoring streambanks, and increasing public access; 12 recommendations that pertain to community information and education; and 1 recommendation that pertains to supporting and advancing federal stormwater regulations). As those projects are completed and programs are put in place, a better understanding of what must be done to restore and maintain the Milwaukee Estuary AOC will be attained. Subsequent recommendations will be developed to address the needs identified.

#### **☒ Remediation**

- The highest priority in the AOC continues to be addressing contaminated sediments. Funding is needed to continue moving forward with the RAP sediment management strategy.

#### **☐ Habitat/Resource Management**

#### **☒ P2/Nonpoint Source**

- Continue various demonstration projects being conducted throughout the basin.

#### **☐ Human Health**

#### **☐ Stewardship Sustainability**

#### **☐ Education and Outreach**

#### **☐ Research Projects/Data Gaps**

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## Manistique River Area of Concern

### **Background**

The Manistique River flows southwest through Schoolcraft County in Michigan's central Upper Peninsula, discharging into Lake Michigan at Manistique. The Area of Concern (AOC) is the last 1.7 miles of the river, from the dam to the mouth of the harbor at Lake Michigan. The physical characteristics of this portion of the river have been significantly altered over the past century, with construction of artificial islands in the river for use as boat docks during the lumbering era in the late 1800s, the building of harbor breakwaters in 1913, and the completion of the dam and flume in the 1920s.



Historical uses of Manistique River waters in the AOC include receiving wastes from sawmills, a papermill, small industries, and the municipal wastewater treatment plant, as well as navigation for shipping, ferrying, recreational boating, and commercial fishing. Current uses include receiving the wastewater discharges from Manistique Papers, Inc. and the City of Manistique Wastewater Treatment Plant. Recreational uses are primarily boating, sightseeing, and fishing.

### **Beneficial Use Impairments**

Beneficial use impairments resulted from poly-chlorinated biphenyls (PCBs), oils, and heavy metals identified as contaminants in the 1970s. In addition, large quantities of undecomposed sawdust remain in harbor and river sediments from the white pine lumbering era of more than 100 years ago, along with the relatively sterile sandy sediment that eroded from river banks as a result of log drives on the river.

#### **Beneficial Use Impairments**

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.     | Eutrophication or undesirable algae.                           |
| Tainting of fish and wildlife flavor.                | Restrictions on drinking water consumption, or taste and odor. |
| Degradation of fish and wildlife populations.        | ✓ Beach closings.  |
| Fish tumors or other deformities.                    | Degradation of aesthetics.                                     |
| Bird or animal deformities or reproductive problems. | Degradation of phytoplankton and zooplankton populations.      |
| ✓ Degradation of benthos.                            | Added cost to agriculture and industry.                        |
| ✓ Restrictions on dredging activities.               | ✓ Loss of fish and wildlife habitat.                           |

### **AOC Status**

The significant progress that has been made in improving water quality in the AOC over the past 18 years has resulted from increased treatment of the wastewater discharged into the river. However, some beneficial uses in the AOC continue to be impaired because of historical pollution. PCB contamination of sediment in the AOC has continued to be the factor prompting the greatest concern in the Manistique River AOC. In 1996, the U.S. Environmental Protection Agency (EPA) proposed that it had developed innovative dredging and treatment technologies that could be used in an environmentally sound dredging project that could remove PCB contamination from the AOC. There was mutual support for the effort among the community, the potentially responsible parties (PRP) and EPA. Under the agreement, the

PRPs will provide funding for the dredging project equal to what it would cost to cap the harbor and maintain it for 30 years (estimated to be \$6 million). EPA will provide additional funding to supplement the PRPs' contribution, if needed, to complete the cleanup. The PRPs also are providing in-kind services to support implementation of the remedy. To date, over 111,000 cubic yards of contaminated sediments have been removed for treatment and disposal.

In 1997, a RAP Update was developed by the local community to address other impaired beneficial uses in the AOC.

### ***RAP Milestones***

- ✓ 1997: Local community developed an update to the RAP.
- ✓ 1995: U.S. EPA began annual dredging based on a remedial action recommendation.
- ✓ 1993: The Manistique River Public Advisory Council (PAC) was officially established.
- ✓ 1987: MDNR submitted the initial RAP to the IJC.

### ***Priorities***

EPA anticipates that all the dredging activities will be completed by winter 2001: Most of the BUT's should be restored; and the process for delisting the AOC may begin.

#### **☒ Remediation**

- Completion of the EPA Superfund dredging of contaminated sediments in the harbor.

#### **☐ Habitat/Resource Management**

#### **☒ P2/Nonpoint Source**

- Streambank erosion control (with nonpoint source pollution best management practices) is needed in the upper watershed to restore fish habitat and prevent sedimentation in the harbor.

#### **☐ Human Health**

#### **☐ Stewardship Sustainability**

#### **☒ Education and Outreach**

- Several local educational projects have been accomplished but additional efforts by and support for the PAC are needed.

#### **☐ Research Projects/Data Gaps**

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# Sheboygan River Area of Concern

## Background

The Sheboygan River Area of Concern (AOC) encompasses the lower Sheboygan River, downstream of the Sheboygan Falls Dam, including the entire harbor and near shore waters of Lake Michigan. The AOC serves as a sink for pollutants carried from three watersheds: the Sheboygan River, the Mullet River, and the Onion River. Pollutants of concern, both conventional and toxic, have been identified as: suspended solids, fecal coliform bacteria, phosphorus, nitrogen, PCBs, PAHs, and heavy metals. Today, industrial, agricultural, and residential areas line the rivers of the Sheboygan River Basin. Agriculture is the dominant land use in the area, occupying a total 67 percent of the land area. A number of past and present pollution sources and practices have contributed to the use impairments identified in the impairment graphic.



## Beneficial Use Impairments

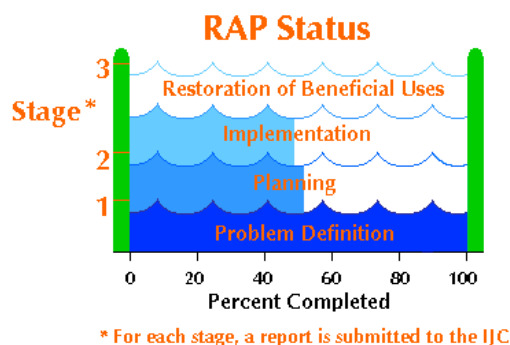
Of the 14 beneficial use impairments, 8 have been identified for the Sheboygan AOC through the Remedial Action Plan (RAP) process.

## RAP Status

A two-year cooperative effort of the Wisconsin Department of Natural Resources (WDNR), other agencies, researchers, and the citizens of the Sheboygan area resulted in the completion of a Sheboygan River and Harbor Stage One RAP in 1989. All the groups worked together to identify management goals for the river and harbor for the year 2000 and to identify specific management strategies and for controlling existing sources of pollution, abate environmental contamination and restore beneficial uses. The goals and objectives of the RAP describe the "desired future state" of the Sheboygan River ecosystem. The Sheboygan County Water Quality Task Force served as the Citizens Advisory Committee (CAC) for Stage One development. The CAC included representatives of industry, government, fishing and conservation groups, and others and was instrumental in facilitating information exchange between environmental agencies and the public. An intergovernmental Technical Advisory Committee provided

### Beneficial Use Impairments

- |  |  |
|--|--|
| ✓ Restrictions on fish and wildlife consumption.       | ✓ Eutrophication or undesirable algae.                         |
| Tainting of fish and wildlife flavor.                  | Restrictions on drinking water consumption, or taste and odor. |
| ✓ Degradation of fish and wildlife populations.        | Beach closings.  |
| ✓ Fish tumors or other deformities.                    | Degradation of aesthetics.                                     |
| ✓ Bird or animal deformities or reproductive problems. | ✓ Degradation of phytoplankton and zooplankton populations.    |
| ✓ Degradation of benthos.                              | Added cost to agriculture and industry.                        |
| ✓ Restrictions on dredging activities.                 | Loss of fish and wildlife habitat.                             |



necessary reviews. In 1994, a revised RAP was prepared by WDNR and other stakeholders; it outlined activities targeted for implementation and progress toward development of a comprehensive strategy for restoring water quality, fisheries, recreational uses, and other benefits of the Sheboygan River Basin. The 1994 RAP was published in October 1995 and was distributed for review at 51 libraries statewide, including the Mead Public Library in Sheboygan and the Memorial Library in Sheboygan Falls. Three work groups (Water Quality, Biota, and Information and Education) were formed to recommend remedial actions for the development of the Stage Two RAP.

The Sheboygan River Superfund project is awaiting a record of decision from EPA. That phase will usher in the long-awaited sediment remediation of the Sheboygan River. WDNR Land and Water staffs from the region and bureau are working with their fellow trustees, the U.S. Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration, to determine the Natural Resource Damage Assessment (NRDA) for the restoration phase for the Sheboygan River Superfund Site.

### ***RAP Milestones***

Fisheries and Water Resources staff completed 45 stream assessments throughout SER as part of baseline monitoring. Fish surveys, macroinvertebrate collections, and habitat assessments were conducted at each site. The data will be used for the State of the Basin reports, dam removal assessments, and stream classifications to provide information for water regulation and zoning projects.

Sheboygan Basin staff also have been working on the Franklin Dam removal project on the Sheboygan River. An environmental assessment was completed, and a public meeting was held.

### ***Priorities***

Improving the quality of the Sheboygan River Basin ecosystem and achieving the "desired future state" will require a long-term commitment from all levels of government, as well as local interest groups and citizens. RAP implementation must promote such involvement at a feasible pace, allowing results to materialize one step at a time. This step-by-step implementation will be based on the recommendations of the RAP. Those recommendations, which are implementable in two-to five-year periods, will be important steps in restoration of the basin. Those steps are not the first; many projects and programs are underway. Recommendations will continue to be developed as understanding deepens about the most efficient and lasting ways to restore the Sheboygan River and Harbor.

Monetary support alone, although important, does not ensure the success of the RAP. Successful implementation of the RAP requires the cooperation of all stakeholders and the willingness of the basin's citizens to voluntarily change the way we lead our lives.

#### **☒ Remediation**

- Superfund Record of Decision finalized and sediment remediation initiated.

#### **☒ Habitat/Resource Management**

- Completion of the Natural Resource Damage Assessment

#### **☐ P2/Nonpoint Source**

#### **☐ Human Health**

### **☑ Stewardship Sustainability**

- Completion of the Franklin Dam project

### **☑ Education and Outreach**

- Web site to manage volunteer water quality monitoring data using the Pigeon River watershed pilot project as an example.

### **☑ Research Projects/Data Gaps**

- Compile data from the stream assessments for the State of the Basin report.

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## Kalamazoo River Area of Concern

### Background

The Kalamazoo River is located in the southwest portion of the lower peninsula of Michigan. The river flows in a westerly direction and discharges into Lake Michigan near the town of Saugatuck. The upstream boundary of the Area of Concern (AOC) is Morrow Dam, which forms Morrow Pond and extends downstream to Lake Michigan, a distance of approximately eighty miles. The Kalamazoo River has been identified as a site of environmental contamination pursuant to the Michigan Natural Resources and Environmental Protection Act 451 and is included on the Superfund National Priorities List.



### Beneficial Use Impairments

The Kalamazoo River has been identified as a Great Lakes AOC because of historical releases of poly-chlorinated biphenyls (PCBs) from de-inking operations at local paper mills. The Remedial Action Planning (RAP) process identified eight of the Great Lakes Water Quality Agreement's 14 beneficial uses as impaired. Beneficial use impairments in the AOC include restrictions on fish and wildlife consumption, degradation of fish and wildlife populations, bird or animal deformities or reproductive problems, degradation of benthos, restrictions on dredging activities, beach closings, degradation of aesthetics, and loss of fish and wildlife habitat.

#### Beneficial Use Impairments

✓ Restrictions on fish and wildlife consumption.	Eutrophication or undesirable algae.
Tainting of fish and wildlife flavor.	Restrictions on drinking water consumption, or taste and odor.
✓ Degradation of fish and wildlife populations.	✓ Beach closings.
Fish tumors or other deformities.	✓ Degradation of aesthetics.
✓ Bird or animal deformities or reproductive problems.	Degradation of phytoplankton and zooplankton populations.
✓ Degradation of benthos.	Added cost to agriculture and industry.
✓ Restrictions on dredging activities.	✓ Loss of fish and wildlife habitat.

### AOC Status

Since the PCB contamination was identified as a problem in 1971, several actions have been taken to improve conditions within the AOC. The discharge of PCBs has been substantially reduced because of the ban on PCB production and other regulatory point source controls, such as the National Pollutant Discharge Elimination System (NPDES) permit program. PCB-laden sediments eroding from Portage Creek banks at Bryant Mill Pond have been removed. PCB-contaminated soils at landfills have been encapsulated. A remediation plan for PCB-contaminated sediments in the Kalamazoo River is being developed.

### RAP Milestones

- ✓ 1999: PAC establishes itself as the Kalamazoo Watershed Council with 501(c)(3) status.
- ✓ 1998: MDEQ published the Kalamazoo River RAP
- ✓ 1993: Kalamazoo PAC was established.
- ✓ 1987: MDEQ completed the draft Stage One Kalamazoo River RAP.

## **Priorities**

The Kalamazoo River Watershed Council (KAWC) believes that the clean-up level used for PCB contaminated sediments should be the most stringent ones applicable and protective of life in and along the river. The KRWC has published the Position Statement on the Clean-up and Protection of the Kalamazoo River, and is actively seeking endorsements. To date, a number of organizations, county and local governments, and state and federal elected representatives have endorsed this position statement.

The KRWC has developed and distributed educational materials about their organization, the river, and actions that people can take to protect water quality and public health throughout the watershed. Watershed management projects in several sub-basins are working to reduce pollutant inputs and develop preventative land use measures. Stormwater management plans and projects are underway in both Kalamazoo and Battle Creek. A phosphorous total maximum daily load for Lake Allegan has been established and reduction implementation is underway.

### ☒ **Remediation**

- Superfund Records of Decision finalized and recommendations implemented.

### ☒ **Habitat/Resource Management**

- Habitat restoration at sites identified by local organizations and district staff.

### ☒ **P2/Nonpoint Source**

- Nonpoint source pollution control projects completed at sites identified by local organizations and district staff.

### ☐ **Human Health**

### ☒ **Stewardship Sustainability**

- Local land use planning educational efforts for elected and appointed local officials. GIS data is available for this application.

### ☒ **Education and Outreach**

- Public education on health issues and pollution prevention.
- Support for the Kalamazoo River Watershed Council.

### ☐ **Research Projects/Data Gaps**

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## Waukegan Harbor Area of Concern

### Background

The Waukegan Area of Concern (AOC) is located in Lake County, Illinois, on the west shore of Lake Michigan. There is also an expanded study area (ESA), bounded by Dead River on the north; a bluff line that parallels Sheridan Road on the west, the southern boundary of the former U.S. Steel Property on the south, and the near shore waters of Lake Michigan on the east. The ESA was added to explore additional concerns of the citizens about areas beyond the AOC.



A natural inlet and portions of adjacent wetlands were filled to form the present shape of the harbor. Waukegan Harbor consists of approximately 1.2 km<sup>2</sup> of industrial, commercial, municipal, and open or vacant lands. The watershed of the Waukegan ESA contains the Waukegan River drainage basin, the North Ditch drainage basin, and other near shore areas that drain to Lake Michigan.

### Beneficial Use Impairments

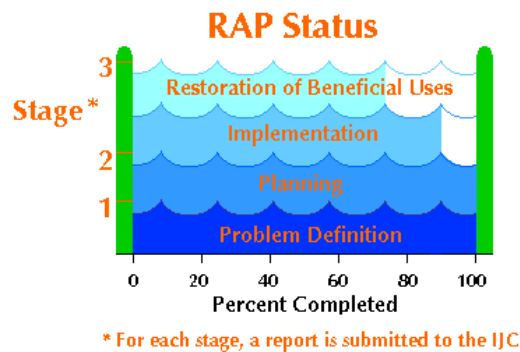
Of 14 beneficial use impairments, 5 have been identified for the Waukegan ESA (those checked on the impairment graphic), on the basis of listing criteria approved by the International Joint Commission (IJC) in 1991. Impairments include degradation of benthos, restrictions on dredging, beach closings, degradation of phytoplankton populations, and loss of fish and wildlife habitat. Signs warning anglers not to eat fish caught in Waukegan North Harbor were removed on February 20, 1997, as directed by the Illinois Department of Public Health. Monitoring of fish from both the harbor and Lake Michigan over the past three years has shown no appreciable difference in PCB concentrations between the North Harbor and other harbors and the open lake.

#### Beneficial Use Impairments

Restrictions on fish and wildlife consumption.	Eutrophication or undesirable algae.
Tainting of fish and wildlife flavor.	Restrictions on drinking water consumption, or taste and odor.
Degradation of fish and wildlife populations.	✓ Beach closings.
Fish tumors or other deformities.	Degradation of aesthetics.
Bird or animal deformities or reproductive problems.	✓ Degradation of phytoplankton and zooplankton populations.
✓ Degradation of benthos.	Added cost to agriculture and industry.
✓ Restrictions on dredging activities.	✓ Loss of fish and wildlife habitat.

### RAP Status

A Waukegan Harbor Citizen Advisory Group (CAG) was organized in 1990 to act as a local advisory group to the Illinois Environmental Protection Agency to address environmental concerns in the AOC. The CAG includes representatives of industry, fishing interests, and environmental interests as well as residents.



The first stage of the Waukegan Harbor Remedial Action Plan (RAP), detailing the use impairments and providing a definition of the problems, was completed in 1993, following extensive review and comment by the CAG and an Interagency Workgroup (IAWG). Stage Two focuses on specific pollutant loads to the AOC and the ESA, as well as the remedial actions planned to restore the impaired uses of the contaminated sites. Revision of the Stage Two document was based on the comments of the CAG and the IAWG. The Stage Two RAP public meeting and review by the IJC were accomplished in September 1995. The Stage Three RAP was released in 1999.

### ***RAP Milestones***

- ✓ 1993: Stage One of the RAP was completed
- ✓ 1995: Stage Two RAP public meeting and IJC review were accomplished.
- ✓ 1999: The Stage III RAP was submitted.

### **Priorities**

Four major remedial actions have been completed that will significantly reduce the quantity of contaminants in Waukegan Harbor and the nearshore area. Approximately 453,600 kg (1 million pounds) of PCBs were removed during remediation activities at the Outboard Marine Corporation site. The other three major remedial actions include the Johns-Manville Company, Waukegan Paint and Lacquer and the Waukegan Tar Pit. At Waukegan Paint and Lacquer, approximately 15 m<sup>3</sup> of paints, solvents and flammable solids were removed from weathered tanks before leaking into sandy soil next to Lake Michigan. At the Johns-Manville site, asbestos covering nearly 24 ha has been remediated to prevent entry into Lake Michigan. Two remedial investigations are underway on adjacent property of Waukegan Manufactured Gas and Coke and the Greiss-Pfleger Tannery. Both of these sites are suspected of contributing to surface and groundwater contamination. These remedial investigations are being funded by private parties through coordination with state and federal regulatory agencies.

The Waukegan CAG has been instrumental in obtaining cooperation from local parties involving additional investigations. Groundwater monitoring from local parties was completed in an area south of the harbor. The CAG helped obtain access from private businesses and federal grant money to install the monitoring wells. An adjacent salvage yard ceased operation in 1993 and the CAG is working with a local bank, who holds the property title, to resolve environmental concerns about the site.

### **☒ Remediation**

- Facilitate an agreed upon location for a confined disposal facility that would house sediment dredged from the shipping channel.
- Raise funds to fulfill the local share match for the U.S. Army Corps of Engineers dredging of the shipping channel.

### **☒ Habitat/Resource Management**

- Fish sampling of the harbor during Spring, 2000.

### **☐ P2/Nonpoint Source**

### **☐ Human Health**

☐ **Stewardship Sustainability**

☒ **Education and Outreach**

- Co-sponsor the GLWQB annual meeting in May, 2000.

☐ **Research Projects/Data Gaps**

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